

Serial No. New U.S. Patent Application

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1-25. (Cancelled)
26. (New) An apparatus for presenting a highly spatially accurate visualization of a scene from which measurements can be taken, the apparatus comprising:
- at least one camera for recording a plurality of frames of video images of the scene;
 - at least one sensor mounted in relation to the camera for recording sensor data on positional characteristics of the camera as the at least one camera is moved with respect to the scene; and
 - image processing means including a first module for synchronizing the frames with the sensor data to form corrected frames, and a second module for constructing an accurate mosaic from the corrected frames.
27. (New) The apparatus as claimed in Claim 26, wherein the at least one camera is a video camera capturing two dimensional digital images.
28. (New) The apparatus as claimed in Claim 26, wherein the at least one sensor comprises a sensor capable of making a positional measurement.

29. (New) The apparatus as claimed in Claim 28, wherein the at least one sensor comprises a digital compass.

30. (New) The apparatus as claimed in Claim 28, wherein the at least one sensor comprises an altimeter and/or bathymetric sensor.

31. (New) The apparatus as claimed in Claim 26, wherein the at least one camera and the at least one sensor are mounted on a moving platform.

32. (New) The apparatus as claimed in Claim 26, wherein the apparatus further includes a calibration system from which the at least one camera is calibrated.

33. (New) The apparatus as claimed in Claim 26, wherein the first module performs a perspective correction to the images using the sensor data.

34. (New) The apparatus as claimed in Claim 26, wherein the second module accomplishes video mosaicing via a correlation technique based on frequency contents of the images being compared.

35. (New) The apparatus as claimed in Claim 26, wherein the apparatus further includes display means for providing a visual image of the mosaic.

36. (New) The apparatus as claimed in Claim 26, wherein the apparatus further comprises data storage means to allow the mosaic to be stored.

37. (New) The apparatus as claimed in Claim 26, wherein the apparatus includes a graphic user interface (GUI).

38. (New) A method for presenting a highly spatially accurate visualization of a scene from which measurements can be taken, the method comprising:

- (a) recording a plurality of frames of video images of the scene from a camera;
 - (b) recording sensor data on positional characteristics of the camera as the camera is moved with respect to the scene;
 - (c) synchronizing the frames with the sensor data to form corrected frames;
- and
- (d) constructing an accurate mosaic from the corrected frames.

39. (New) The method as claimed in Claim 38, wherein the method includes a step of calibrating the camera prior to performing step (a).

40. (New) The method as claimed in Claim 38, wherein the synchronization step includes the step of performing a perspective correction to the images using the sensor data.

41. (New) The method as claimed in Claim 38, wherein the step of video mosaicing is achieved using a correlation technique based on frequency contents of the images being compared.

42. (New) The method as claimed in Claim 38, wherein the method further includes the step of providing a visual image of the mosaic.

43. (New) The method as claimed in Claim 38, wherein the method further includes the step of taking a measurement from the visual image.

44. (New) The method as claimed in Claim 38, wherein the method includes the step of storing the images so that they may be accessed by spatial position.

45. (New) A method of performing a survey in a fluid, the method comprising:
(a) mounting a camera and a plurality of sensors on a platform capable of movement in the fluid;

(b) moving the platform through the fluid while recording visual images on the camera and recording sensor data relating to the attitude and distance of the platform from objects of interest within the fluid;

(c) synchronizing the visual images to the sensor data to provide corrected visual images relating to a fixed distance and attitude; and

(d) video mosaicing the images to form an accurate video mosaic as a visual image of the scene surveyed.

46. (New) The method as claimed in Claim 45, wherein the method includes the step of pre-calibrating the camera to compensate for distorting artifacts inherent within the camera.

47. (New) The method as claimed in Claim 45, wherein the method includes the step of displaying the visual image.

48. (New) The method as claimed in Claim 45, wherein the method includes the step of taking a measurement from the visual image.

49. (New) The method as claimed in Claim 45, wherein the platform is mounted on a remotely operated vehicle (ROV).

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50. (New) The method as claimed in Claim 45, wherein the method includes the step of storing the mosaiced images for viewing later.